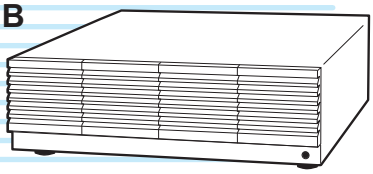
KIKUSUI

PART NO. Z1-005-160, IB022734
Feb. 2015

Operation Manual

Electronic Load Booster

PLZ2004WB
PLZ2004WHB



The PLZ2004WB/PLZ2004WHB Load Booster is used to increase the input current to the PLZ1004W/PLZ1004WH Electronic Load. One PLZ1004W/PLZ1004WH is made the master unit, and load boosters connected in parallel operate as slave units.

Number of load boosters	Maximum current/ Maximum power	
	PLZ2004WB	PLZ2004WHB
1	600 A / 3000 W	150 A / 3000 W
2	1000 A / 5000 W	250 A / 5000 W
3	1400 A / 7000 W	350 A / 7000 W
4	1800 A / 9000 W	450 A / 9000 W

About the Operation Manuals

This manual contains an overview of the PLZ2004WB/PLZ2004WHB electronic load booster and information about connecting, maintenance, and using it. For information on how to perform parallel operation, see the PLZ-4W/PLZ-4WH Series Electronic Load User's Manual.

These operation manuals are intended for users of electronic loads and their instructors. Explanations are given under the presumption that the reader has knowledge of electronics and electronic loads.

Every effort has been made to ensure the accuracy of this manual. However, if you have any questions or find any errors or omissions, please contact your Kikusui agent or distributor.

If you find any misplaced or missing pages in the manuals, they will be replaced. If the manual gets lost or soiled, a new copy can be provided for a fee. In either case, please contact your Kikusui agent or distributor, and provide the "Kikusui Part No." given on the cover.

After you have finished reading this manual, store it so that you can use it for reference at any time.。

Features

- Up to four load boosters can be connected in parallel.
- The combination of PLZ2004WBs and a PLZ1004W master unit can create an electronic load of up to 9 kW and 1800 A.

  The combination of PLZ2004WHBs and a PLZ1004WH master unit can create an electronic load of up to 9 kW and 450 A.

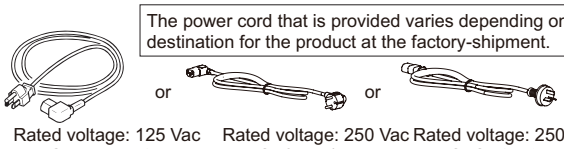
  The master unit displays the total current and total wattage. The units connected in parallel can be used as a single electronic load.
- The connection of the control cables is easy. The control cable used to connect between the master unit and the load booster and between each load booster is one flat cable each.
- There is no power switch. The AC input power is turned ON/OFF by the master unit.

Checking the Package Contents

When you receive the product, check that all accessories are included and that the product and accessories have not been damaged during transportation. If any of the accessories are damaged or missing, contact Kikusui distributor/agent.

Accessories (PLZ2004WB)

The power cord that is provided varies depending on the destination for the product at the factory-shipment.



Rated voltage: 125 Vac
PLUG: NEMA5-15
[85-AA-0003]

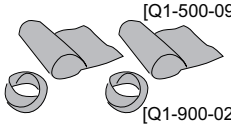
or

Rated voltage: 250 Vac
PLUG: CEE7/7
[85-AA-0005]

or

Rated voltage: 250 Vac
PLUG: GB1002
[85-10-0790]

☐ Power cord (1 pc.)



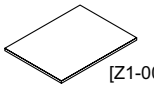
[Q1-500-096]
[Q1-900-020]

☐ Load input terminal cover (2 pcs.) [with auxiliary band]

If necessary, attach to the product.

[A8-900-153]

☐ Heavy object warning label (1 pc.)



[Z1-005-160]

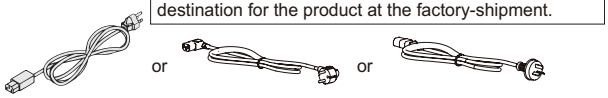
☐ Operation manual (1 copy)

[M1-100-027]
[M5-101-009]
[M4-100-009]

☐ Set of screws for the load input terminal (2 sets)

Accessories (PLZ2004WHB)

The power cord that is provided varies depending on the destination for the product at the factory-shipment.



Rated voltage: 125 Vac
PLUG: NEMA5-15
[85-AA-0004]

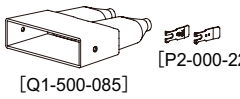
or

Rated voltage: 250 Vac
PLUG: CEE7/7
[85-AA-0005]

or

Rated voltage: 250 Vac
PLUG: GB1002
[85-10-0790]

☐ Power cord (1 pc.)



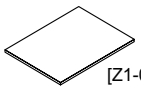
[Q1-500-085]
[P2-000-228]

☐ Load input terminal cover (1 pc.) Lock plate (2 pcs.)

If necessary, attach to the product.

[A8-900-153]

☐ Heavy object warning label (1 pc.)



[Z1-005-160]

☐ Operation manual (1 copy)

[M1-100-012]
[M5-101-007]
[M4-100-007]

☐ Set of screws for the load input terminal (2 sets)

KIKUSUI ELECTRONICS CORP.

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TEL: +81-45-593-0200 Fax: +81-45-593-7571

Website **http://www.kikusui.co.jp/en**

The newest version of the operation manual can be downloaded from Download service of Kikusui website.

Safety Symbols

For the safe use and safe maintenance of this product, the following symbols are used throughout this manual and on the product. Note the meaning of each of the symbols to ensure safe use of the product. (Not all symbols may be used.)

or	Indicates that a high voltage (over 1000 V) is used here. Touching the part causes a possibly fatal electric shock. If physical contact is required by your work, start work only after you make sure that no voltage is output here.
DANGER	Indicates an imminently hazardous situation which, if ignored, will result in death or serious injury.
WARNING	Indicates a potentially hazardous situation which, if ignored, could result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation which, if ignored, may result in damage to the product and other property.
	Shows that the act indicated is prohibited.
	Indicates a general danger, warning, or caution. When this symbol is marked on the product, see the relevant sections in this manual.
	Protective conductor terminal.
	Chassis (frame) terminal.
	On (supply)
	Off (supply)
	In position of a bi-stable push control
	Out position of a bi-stable push control

⚠ Safety Precautions

The following safety precautions must be observed to avoid fire hazards, electric shock, accidents, and other failures. Keep them in mind and make sure to observe them.

Using the product in a manner that is not specified in this manual may impair the protection functions provided by the product.

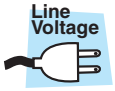
Users

- This product must be used only by qualified personnel who understand the contents of this operation manual.
- If unqualified personnel is to use the product, be sure the product is handled under the supervision of qualified personnel (those who have electrical knowledge). This is to prevent the possibility of personal injury.

Purpose

- Never use the product for purposes other than the product's intended use.
- This product is not designed or manufactured for general home or consumer use.

Input power



- Use the product within the rated input power voltage range.
- For applying power, use the power cord provided. (see page 7).
- This product is designed as an equipment of IEC Overvoltage Category II (energy-consuming equipment supplied from the fixed installation).

Cover

- Some parts inside the product may cause physical hazards. Do not remove the external cover.

Grounding

- This product is IEC Safety Class I equipment (equipment with a protective conductor terminal). To prevent electric shock, be sure to connect the protective conductor terminal of the product to electrical ground (safety ground).

Operation

- If a malfunction or abnormality is detected on the product, stop using it immediately, and remove the power plug from the outlet or turn off the circuit breaker of switchboard. Make sure the product is not used until it is completely repaired.
- Do not disassemble or modify the product. If you need to modify the product, contact your Kikusui distributor/agent.

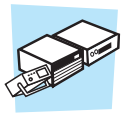
Maintenance and Inspection

- To prevent the possibility of electric shock, remove the power plug from the outlet or turn off the circuit breaker of switchboard before carrying out maintenance or inspection.
- Check periodically that there are no tears or breaks in the power cord.
- If the panel needs cleaning, gently wipe it using a soft cloth with water-diluted neutral detergent. Do not use volatile chemicals such as benzene or thinner.
- To maintain the performance and safe operation of the product, it is recommended that periodic maintenance, inspection, cleaning, and calibration be performed.

Adjustments and Repairs

- Kikusui service engineers will perform internal service on the product. If the product needs adjustment or repairs, contact your Kikusui distributor/agent.

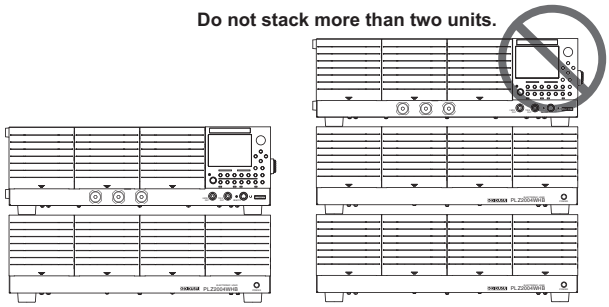
⚠ Precautions Concerning Installation Location



Be sure to observe the following precautions when installing the product.

- Do not use the product in a flammable atmosphere.
  To prevent the possibility of explosion or fire, do not use the product near alcohol, thinner, or other combustible materials, or in an atmosphere containing such vapors.
- Avoid locations where the product is exposed to high temperature or direct sunlight.
  Do not install the product near a heater or in areas subject to drastic temperature changes. For this product's operating and storage temperatures, see this specifications.
- Avoid high humidity.
  Do not install the product in high-humidity locations--near a boiler, humidifier, or water supply. For this product's operating and storage humidity, see this specifications. Condensation may occur even within the operating humidity range. In such cases, do not use the product until the condensation dries up completely.
- Be sure to use it indoors.
  This product is designed for safe indoor use.
- Do not install the product in a corrosive atmosphere.
  Do not install the product in a corrosive atmosphere or in environments containing sulfuric acid mist, etc. This may cause corrosion of various conductors and bad contacts of terminals inside the power supply leading to malfunction and failure, or in the worst case, a fire.
- Do not install the product in a dusty location.
  Accumulation of dust can lead to electric shock or fire.
- Do not use the product where ventilation is poor.
  Secure adequate space around the product so that air can circulate around it. Allow at least 20 cm of space between the inlet and vent holes and any walls or obstructions.
- Do not place objects on the product.
  Placing objects on top of the product can cause failures (especially heavy objects).
- Do not install the product on an inclined surface or location subject to vibrations.
  The product may fall and break or cause personal injury.
- Do not use the product in a location where strong magnetic or electric fields are nearby or a location where large amount of distortion and noise is present on the input power supply waveform.
  The product may malfunction.
- Do not stack more than two units on top of each other.
  The units (load booster and master unit) can be stacked, but do not stack more than two units on top of each other for safety reasons. If you are using multiple load boosters, it is recommended that they be mounted on a rack.

Do not stack more than two units.



Precautions to Be Taken When Moving the Product

Note the following points when moving or transporting the product to the installation location.

- Turn off the power switch.
  Moving the product while the power is turned on can cause electric shock or damage to it.
- Have two or more people move the unit.
  The unit weighs over 20 kg. Have two or more people move the unit. Use extra precaution at inclines and steps.
- Remove all wiring.
  Moving the product with the wires connected can cause wires to break or injuries due to the product falling over.
- When transporting the product, be sure to use the original packing materials.
  Otherwise, damage may result from vibrations or from the product falling during transportation.
- Be sure to include this manual.

Notation Used in the Guide

- In this manual, the PLZ-4W Series Electronic Load is sometimes referred to as the “PLZ-4W Series” or "booster." In this manual, the PLZ-4WH Series Electronic Load is sometimes referred to as the “PLZ-4WH Series” or "booster."
- In this manual, the PLZ2004W Electronic Load is sometimes referred to as the “PLZ2004W.” In this manual, the PLZ2004WH Electronic Load is sometimes referred to as the “PLZ2004WH.”
- The following markings are used in the explanations in the text.

⚠ WARNING

- Indicates a potentially hazardous situation which, if ignored, could result in death or serious injury.

⚠ CAUTION

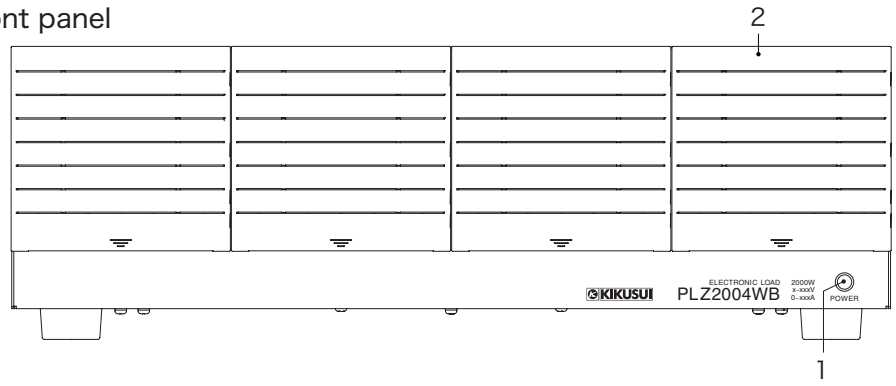
- Indicates a potentially hazardous situation which, if ignored, may result in damage to the product and other property.

> Indicates menu settings that you select. The menu item to the left of the > symbol is a higher level menu.

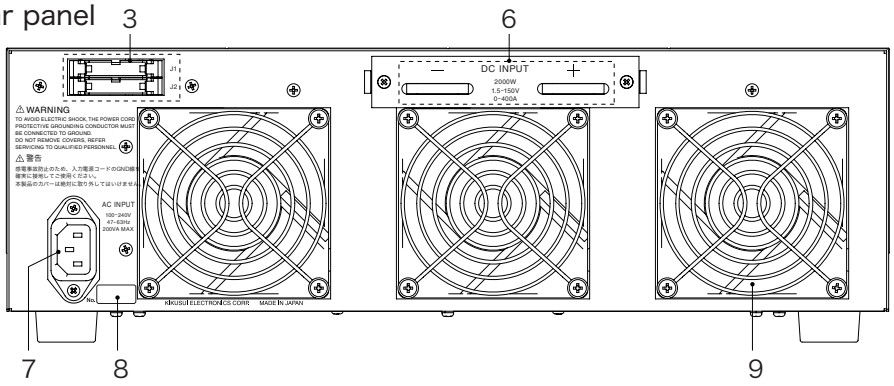
Front Panel and Rear Panel

PLZ2004WB

Front panel

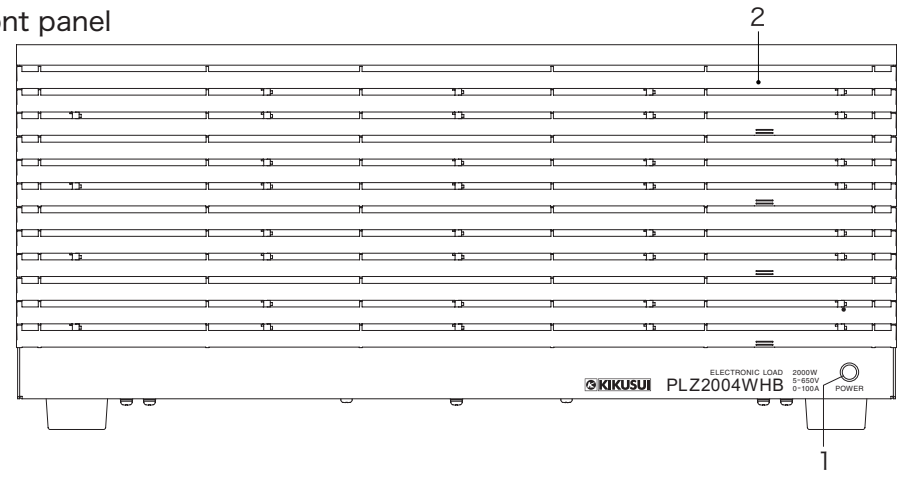


Rear panel

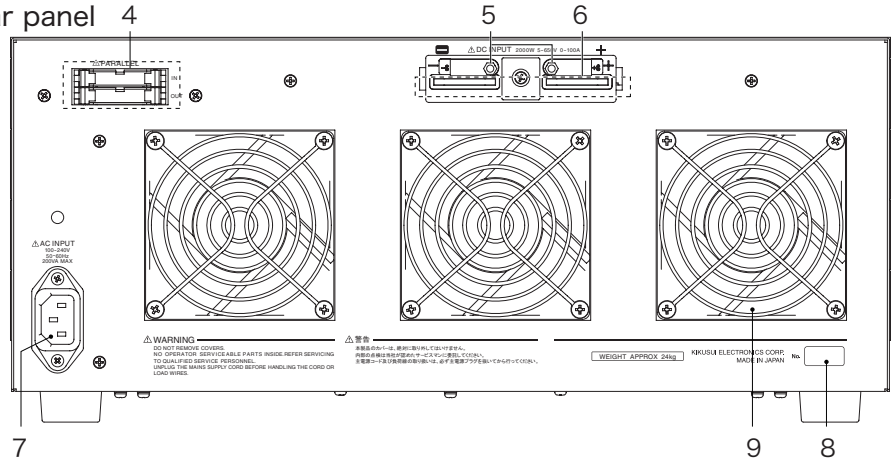


PLZ2004WHB

Front panel



Rear panel



1. POWER lamp

Illuminates when the power switch of the master unit is on when the load booster is connected in parallel with the master unit. It indicates that AC input power is being supplied.

2. Air intake (louver)

Inlet port used to exhaust the internal heat using a fan.

3. J1 and J2 connectors (only on the PLZ2004WB)

Connectors used to connect the optional flat cable to enable parallel operation. The upper connector is the J1 connector, and the lower connector is the J2 connector.

4. PARALLEL connector (only on the PLZ2004WHB)

Connectors used to connect the optional flat cable to enable parallel operation. The upper connector is the IN connector, and the lower connector is the OUT connector.

5. Remote sensing terminal (only on the PLZ2004WHB)

The remote sensing terminal is not used.

6. DC INPUT (Load input terminal)

Input connector used to connect to the equipment under test.

7. AC INPUT connector

AC power input connector.

8. Serial number

9. Air outlet

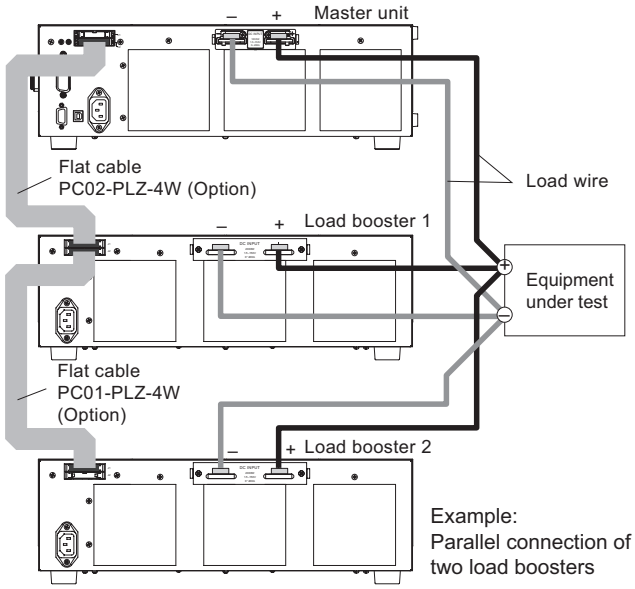
Air outlet used to exhaust the internal heat using a fan.

Parallel Connection

Use a signal wire to connect the load booster to the master unit. Use a load wire to connect the load booster to the EUT.

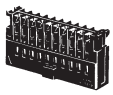
You can connect up to four boosters.

Separate the load cable from the flat cable as much as possible to prevent unstable operation.



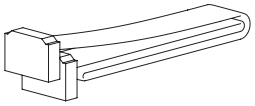
Example:
Parallel connection of two load boosters

Connecting the Signal Cables



[84-49-0071]

A protective socket is attached to the J1 connector (PLZ2004WB) or PARALLEL connector (PLZ2004WHB) when the PLZ2004WB/PLZ2004WHB is in the factory default state. Keep the protective socket in a safe place so that you can attach it to the connector when the connector is not in use. If the protective socket is damaged or lost, contact your Kikusui agent or distributor.



Use the optional flat cable for the signal wire. It comes in two lengths.

Model	Length	Explanation
PC01-PLZ-4W	300 mm (11.81")	For connecting boosters to each other
PC02-PLZ-4W	550 mm (21.65")	For connecting the master unit to a booster

CAUTION

To avoid damaging the product, observe the following precautions.

- Do not connect the cables to the wrong connectors.
- Do not operate the PLZ-4W or PLZ4WH alone with the flat cable connected.
- Do not mix the PLZ2004WB and PLZ2004WHB units together in parallel operation.

1 **Check that the master unit's POWER switch is turned off (○).**

2 **Check that the booster power cords are not connected.**

3 **If you are using PLZ2004WBs, connect the J2 connector of the master unit to the J1 connector of the first booster.**

If you are using PLZ2004WHBs, connect the PARALLEL OUT connector of the master unit to the PARALLEL IN connector of the first booster.

4 **If you are using PLZ2004WBs, connect the J2 connector of the first booster to the J1 connector of the second booster.**

If you are using PLZ2004WHBs, connect the PARALLEL OUT connector of the first booster to the PARALLEL IN connector of the second booster.

Continue connecting all the remaining boosters in the same manner.

This completes the procedure for connecting the signal wires.

Load wiring

The cautions and things that you need to consider when you are wiring the loads are the same as when you are wiring the loads of the PLZ1004W/PLZ1004WH. To ensure operational stability, see "Methods for Ensuring Stable Operation" in chapter 1, "Installation and Preparation" of the PLZ1004W/PLZ1004WH User's Manual.

WARNING

- Improper use of load wires may lead to fire. Use load wires whose capacity is adequate for the PLZ-4W/PLZ-4WH's rated output current.
- Possible electric shock. Use load wires whose rated voltage meets or exceeds the PLZ-4W/PLZ-4WH's isolation voltage. For details of isolation voltage, see "General specifications" of this manual.

CAUTION

Use a load wire with sufficient diameter for the current as well as non-flammable or flame-resistant cover.

If the wiring that you use for the load has a high resistance, the voltage will drop significantly when current flows, and the voltage at the load input terminals may fall below the minimum operating voltage. Using the following table as a reference, select wiring whose nominal cross-sectional area is as thick as possible.

A wire's temperature is determined by the resistive loss based on the current, the ambient temperature, and the wire's external thermal resistance. The following table shows the current capacity of heat-resistant vinyl wires that have a maximum allowable temperature of 60 °C when one of the wires is separated and stretched out horizontally in air in an ambient temperature of 30 °C. The current must be reduced under certain conditions, such as when vinyl wires that have a low heat resistance are used, when the ambient temperature is 30 °C or greater, or when wires are bundled together and little heat is radiated.

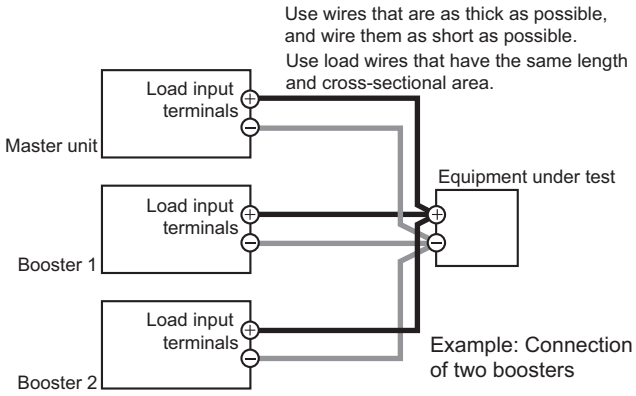
Nominal Cross-Sectional Area [mm^2]	AWG	(Reference Cross-Sectional Area) [mm^2]	Allowable Current[1] [A] (Ta = 30 °C)	Kikusui-Recommended Current [A]
2	14	(2.08)	27	10
3.5	12	(3.31)	37	-
5.5	10	(5.26)	49	20
8	8	(8.37)	61	30
14	6	(13.3)	88	50
22	4	(21.15)	115	80
30	2	(33.62)	139	-
38	1	(42.41)	162	100
50	1/0	(53.49)	190	-
60	2/0	(67.43)	217	-
80	3/0	(85.01)	257	200
100	4/0	(107.2)	298	-
125	-	-	344	-
150	-	-	395	300
200	-	-	469	-
250	-	-	556	-
325	-	-	650	-

1. Excerpts from Japanese laws related to electrical equipment.

Connecting the Load Wires

Consider the current that you will be using, and use wires that are thick as possible. Also, wire them as short as possible. Use load wires that have the same length and cross-sectional area.

The load input terminal of the master unit (PLZ1004W/PLZ1004WH) is not designed to handle as large a current as the load input terminal of the booster. Separate the load wires that are connected to the EUT into those that are connected to the master unit and those that are connected to the boosters.


Use wires that are as thick as possible, and wire them as short as possible.
Use load wires that have the same length and cross-sectional area.
Load input terminals
Master unit
Equipment under test
Load input terminals
Booster 1
Load input terminals
Booster 2
Example: Connection of two boosters

WARNING

Possible electric shock.

- Do not touch the load input terminal while the power is on.
- Be sure to use the load input terminal cover.

CAUTION

- To avoid damaging the product, observe the following precautions. Be sure to use the load input terminals on the rear panel on the master unit. Do not connect other equipment to the load input terminal on the front panel.
- There is a danger of overcharge. Attach crimping terminal to the wire and use the set of screws that came with the package for connection.

■ Connecting load wires to the PLZ2004WB

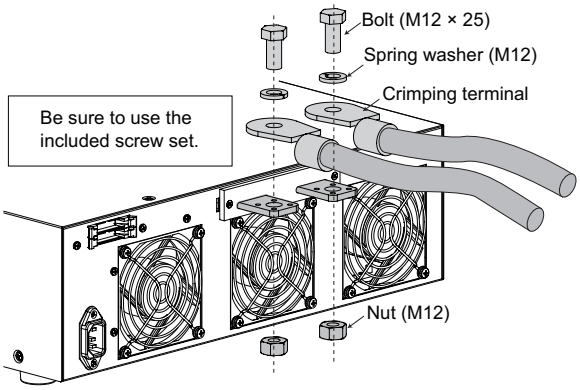
1 Check that the POWER switch of master unit is off (◯).

2 Check that the booster power cords are not connected.

3 Make sure that the output of the EUT is off.

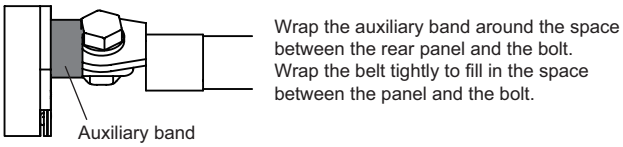
4 Connect load wires to the load input terminal on the master unit's rear panel as shown in the PLZ1004W user's manual.

5 Connect the load wires to the load input terminals on the booster using the included load input terminal screw set.

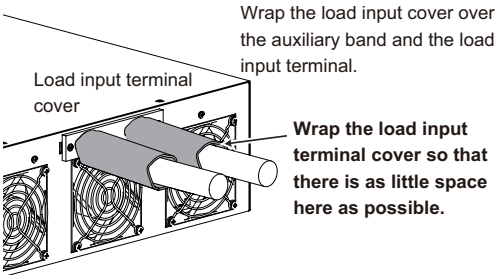


6 For each of the booster's load input terminals, wrap the included auxiliary band around the space between the rear panel and the bolt.

The auxiliary band prevents the load input terminal cover from slipping. Wrap the belt tightly to fill in the space between the panel and the bolt.


Wrap the auxiliary band around the space between the rear panel and the bolt.
Wrap the belt tightly to fill in the space between the panel and the bolt.
Auxiliary band

7 Wrap the load input terminal covers around the booster's load input terminals.


Wrap the load input cover over the auxiliary band and the load input terminal.
Load input terminal cover
Wrap the load input terminal cover so that there is as little space here as possible.

8 Connect the load wires of the master unit and the boosters to the EUT.

9 Check the polarity of the connections.

This completes the procedure for connecting the load wires.

■ Connecting load wires to the PLZ2004WHB

The methods for connecting load wires to a booster's load input terminal and for using the load input terminal covers and lock plates are the same as the methods for the PLZ1004WH. For details, see the PLZ1004WH user's manual.

1 Check that the POWER switch of master unit is off (◯).

2 Check that the booster power cords are not connected.

3 Make sure that the output of the EUT is off.

4 Connect load wires to the load input terminal on the master unit's rear panel as shown in the PLZ1004WH user's manual.

5 Connect load wires to the load input terminal on the booster as shown in the PLZ1004WH user's manual.

6 Connect the load wires of the master unit and the boosters to the EUT.

7 Check the polarity of the connections.

This completes the procedure for connecting the load wires.

Connecting the Power Cord

This product falls under IEC Overvoltage Category II (energy-consuming equipment supplied from the fixed installation).

⚠ WARNING

Possible electric shock.

- This product is IEC Safety Class I equipment (equipment with a protective conductor terminal). Be sure to earth ground the product to prevent electric shock.
- Connect the protective conductor terminal to earth ground.

Use the supplied power cord to connect to an AC power line.

If the supplied power cord cannot be used because the rated voltage or the plug shape is incompatible, have a qualified engineer replace it with an appropriate power cord that is 3 m or less in length. If obtaining an appropriate power cord is difficult, consult your Kikusui agent or distributor.

A power cord with a plug can be used to disconnect the product from the AC line in an emergency. Connect the plug to an easily accessible power outlet so that the plug can be removed from the outlet at any time. Be sure to provide adequate clearance around the power outlet.

Do not use the supplied power cord for other devices.

The load booster does not have a power switch. The AC input power is turned on/off in sync with the master unit.

1 Check that the AC power supply is within the input power supply range of the product.

The voltage that can be applied is any of the nominal power supply voltages in the range of 100 Vac to 240 Vac. The frequency is 50 Hz or 60 Hz.

2 Connect the power cord to the AC INPUT connector on the rear panel.

3 Connect the power cord plug to an outlet with a ground terminal.

Setting the Master Unit

After you finish making the connections, set the number of boosters on the master unit.

If the master unit's response speed has been set to 1/1, its response speed is changed to 1/2 to ensure operational stability. You can use the menu settings to return the response speed to 1/1.

1 Turn on (|) the power to the master unit.

On the master unit, from the menu, select "2. Configuration" > "1.Master/Slave" > "Operation" > "MASTER."

2 Set "Booster" to the number of booster units that have been connected.

3 Turn off (◯) the power to the master unit.

The menu settings are applied. This completes the settings that are necessary to use boosters.

Performing Parallel Operation

After you finish configuring the settings on the master unit, you can perform parallel operation. During parallel operation, the slew rate and response speed settings on the master unit are used.

If large voltage drops occur because of increased wiring inductance or if oscillations occur due to instability of the product caused by current phase lag, reduce the response speed to ensure stable operation.

Turning the Power On and Off

■ Turning the power on

Turn the master unit's POWER switch on. This will also turn the boosters on.

Set the operation mode and configure the settings on the master unit, and turn the load on.

■ Turning the power off

Turn the master unit's POWER switch off. This will also turn the boosters off.

Ending Parallel Operation

To end parallel operation and return to independent operation, turn the master unit off, and then remove the flat cables.

To return the master unit to independent operation, from the menu, select "2. Configuration" > "1.Master/Slave" > "Booster" > "-," and then restart the unit.

⚠ CAUTION

To avoid damaging the product, observe the following precautions.
Do not operate the PLZ-4W or PLZ-4WH alone with the flat cable connected.

Cleaning the Dust Filter

A dust filter is installed on the inside of the louver on the front panel. Periodically clean the filter to prevent clogging.

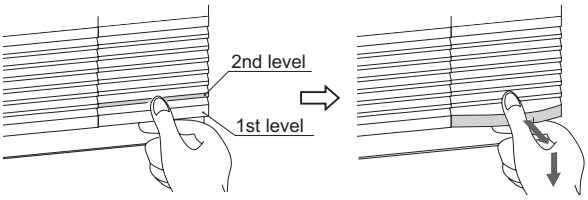
⚠ CAUTION

- Clogged dust filters hinder the cooling of the inside of the instrument and can cause a malfunction and shortening of the service life.
- When the Booster is in operation, air is sucked through the dust filter to cool the load booster. If moister is included in the dust filter, the temperature or humidity inside the Booster increases and may cause a malfunction.

■ Cleaning the PLZ2004WB's dust filter

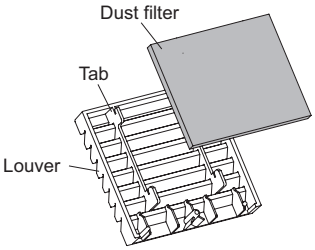
1 Remove the louver from the panel by placing a finger on the 2nd level of the louver and pulling down the 1st level while pulling it toward you.

If the louver does not come off easily, pressing down the top level of the louver will ease the work.



2 Remove the dust filter from the inside of the louver and clean it.

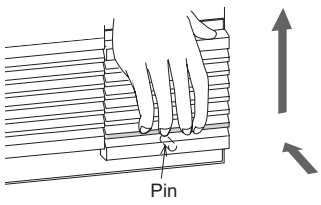
Remove the dust on the dust filter such as by using a vacuum cleaner. If the filter is extremely dirty, clean it using a water-diluted neutral detergent and dry it completely.



3 Attach the dust filter to the louver.

Firmly attach the dust filter so that the louver's tabs protrude out of the top of the dust filter.

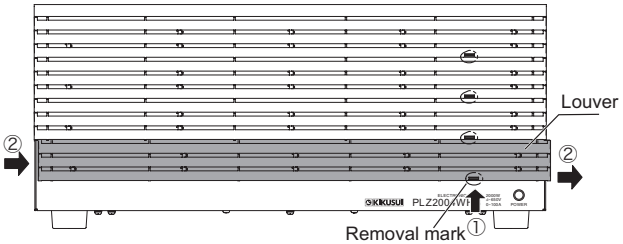
4 Attach the louver to the panel by pulling up on the louver while holding the 2nd level of the louver with your hand until the pin is fixed in place.



■ Cleaning the PLZ2004WHB's dust filter

1 Remove the lower louver from the panel.

While lifting the bottom of the removal mark with your finger tips, slide the entire louver to the right. Then, pull it toward you.



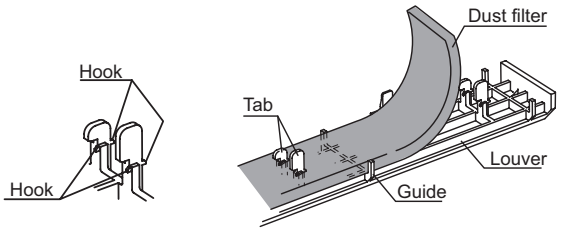
While lifting the bottom of the removal mark with your finger tips (①), slide the entire louver to the right (②).

2 Remove all the remaining louvers in the same manner as was shown in step 1.

3 Remove the dust filter from the inside of the louver and clean it.

There is a hook on the louver tab. Be sure not to get the dust filter caught in the hook when removing the dust filter from the louver.

Remove the dust on the dust filter such as by using a vacuum cleaner. If the filter is extremely dirty, clean it using a water-diluted neutral detergent and dry it completely.

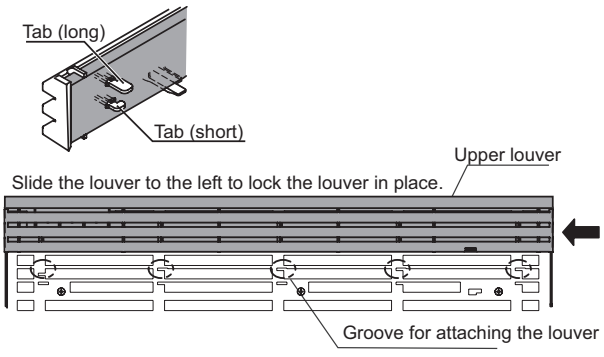


4 Align the dust filter along the guide and attach it to the louver.

Be sure to attach it firmly until the tab hooks of the louver completely passes through the dust filter.

5 Attach the upper louver first.

Align the tab on the inner side of the louver to the panel groove and slide the louver to the left to attach it. You can easily attach the louver by aligning the long tabs (five locations) with the grooves.



Pass the long tabs on the back side of the louver through the grooves on the panel indicated by ◯ circles.

6 Attach all the remaining louvers in the same manner as was shown in step 5.

Calibration

The booster is shipped from the factory after carrying out a strict calibration. However, to maintain the performance, periodic calibration is recommended.

Calibrate the master unit and the boosters as a single electronic load in the same manner as when you calibrate the master unit alone. For details, see "Calibration" in the PLZ1004W/PLZ1004WH User's Manual.

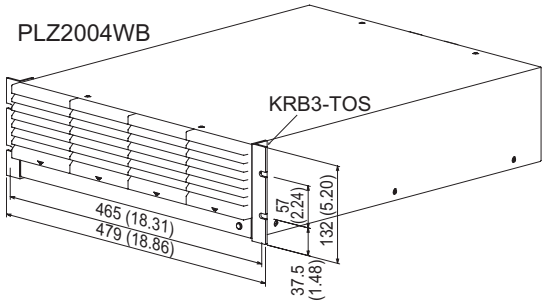
For calibration, use shunt resistors and a regulated DC power supply that match the product's current capacity.

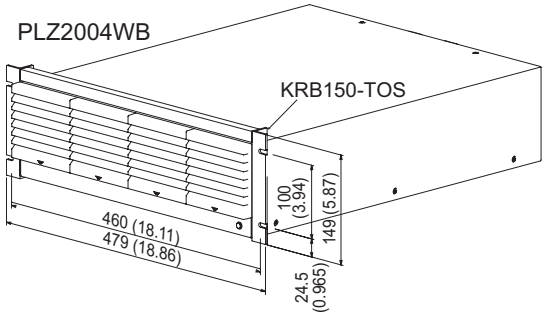
Rack mount bracket

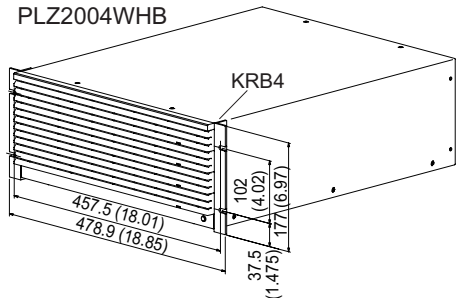
The following brackets are available as options.

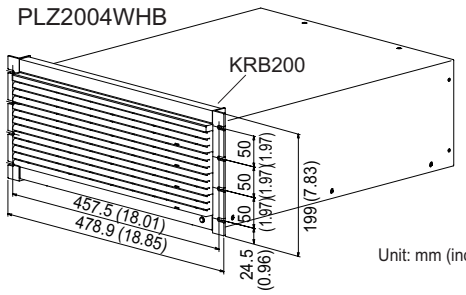
	Inch-rack EIA standard	Milli rack JIS standard
PLZ2004WB	KRB3-TOS	KRB150-TOS
PLZ2004WHB	KRB4	KRB200

For details, contact Kikusui distributor/agent.









Unit: mm (inch)

Specifications

Electrical Specifications

Unless specified otherwise, the specifications are for the following settings and conditions.

- Warm-up period: 30 minutes (with current flowing)
- Ambient temperature: 23 °C± 5 °C
- TYP: These are typical values that are representative of situations where the PLZ2004WB/PLZ2004WHB operates in an environment with an ambient temperature of 23 °C. These values do not guarantee the performance of the PLZ2004WB/PLZ2004WHB.
- % of set denotes % of the input voltage or input current setting.
- % of f.s denotes % of the rated input voltage, rated input current or rated input power.
- % of rdng denotes % of the input voltage or input current reading.

■ Rating (PLZ2004WB)

	PLZ2004WB
Operating voltage	1.5 Vdc to 150 Vdc[1]
Current	400 A
Power	2 000 W
Current setting accuracy[2]	±(1.2 % of set + 1.1 % of f.s)[3]

1. Minimum voltage at which the current starts flowing to the PLZ2004WB is approx. 0.3 V. The PLZ2004WB detects no signal at an input voltage less than or equal to approx. 0.3 V and an input current less than or equal to approx. 1 % of the range rating. If the input voltage is gradually increased from 0 V, no current will flow until 0.3 V is exceeded. Once a current greater than or equal to 1 % of the range rating starts flowing, the current can flow at voltages less than equal to 0.3 V.
2. Condition in which the booster is connected to the master unit.
3. M range applies to the full scale of H range.

■ Rating (PLZ2004WHB)

	PLZ2004WHB
Operating voltage	5 Vdc to 650 Vdc[1]
Current	100 A
Power	2 000 W
Input resistance when the load is off	2.21 MΩ[2]

1. Minimum voltage at which the current starts flowing to the PLZ2004WHB is approx. 0.5 V. The PLZ2004WHB detects no signal at an input voltage less than or equal to approx. 0.5 V and an input current less than or equal to approx. 1 % of the range rating. If the input voltage is gradually increased from 0 V, no current will flow until 0.5 V is exceeded. Once a current greater than or equal to 1 % of the range rating starts flowing, the current can flow at voltages less than equal to 0.5 V.
2. Condition in which the booster is connected to the master unit.

- Constant current (CC) mode

PLZ2004WHB	H range	M range	L range
Operating range	0 A to 100 A	0 A to 10 A	0 A to 1 A
Setting range	0 A to 105 A	0 A to 10.5 A	0 A to 1.05 A
Resolution[1]	10 mA	1 mA	0.1 mA
Ripple[1]	PLZ1004WH specification x (total power capacity/1 kW) (TYP)		

1. When one PLZ2004WHB is connected.
2. Condition in which the booster is connected to the master unit.

- Accuracy of setting

PLZ2004WHB	
CC mode[1]	±(1.2 % of set + 1.1 % of f.s[2])
CR mode	±(1.2 % of set + 1.1 % of f.s[2]) (TYP)
CV mode	±(0.2 % of set + 0.2 % of f.s) (TYP)
CP mode	±(5 % of f.s[2]) (TYP) , at 23°C ±5°C

1. Condition in which the booster is connected to the master unit.
2. The full scale of the range. However, for the M range, it is the full scale of the H range.

- Measurements

PLZ2004WHB	
Accuracy of voltmeter	±(0.1 % of rdng + 0.1 % of f.s) (TYP)
Accuracy of ammeter	±(1.2 % of rdng + 1.1 % of f.s[1]) (TYP)
Wattmeter	Displays the product of the voltmeter reading and ammeter reading.

1. The full scale of the range. However, for the M range, it is the full scale of the H range.

■ Protection function

Protection functions other than those listed below operate on the PLZ1004W/PLZ1004WH. For details, see the PLZ-4W/PLZ-4WH user's manual.

PLZ2004WB/PLZ2004WHB	
Overheat protection (OHP)	Turns off the load when the heat sink temperature reaches 95 °C
Reverse connection protection (REV)	Protection by fuse

■ General Specifications

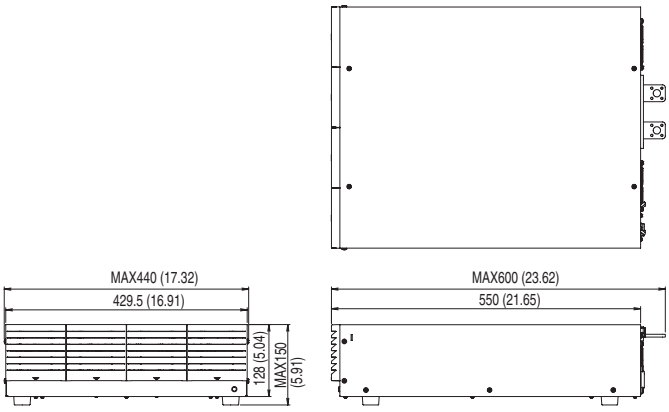
		PLZ2004WB	PLZ2004WHB
Environment	Operating temperature range	0 °C to 40 °C (32 °F to 104 °F)	
	Operating humidity range	20 %rh to 85 %rh (no condensation)	
	Storage temperature range	-25 °C to 70 °C (-13 °F to 158 °F)	
	Storage humidity range	Less than or equal to 90 %rh (no condensation)	
Input line voltage range		100 Vac to 240 Vac (90 Vac to 250 Vac) single phase, continuous	
Input frequency range		47 Hz to 63 Hz	
Power consumption		200 VAmax	
Inrush current		35 A	120 A[1]
Protective conductor current		---	600 µA (100 Vac at 50 Hz; TYP)
Insulation resistance	Primary - input connector, Primary - chassis, Input connector - chassis	500 Vdc, 30 MΩ or more (ambient humidity of 70 %rh or less)	1 000 Vdc, 30 MΩ or more (ambient humidity of 70 %rh or less)
Withstand voltage	Primary - input connector, Primary - chassis,	No abnormalities at 1 500 Vac for 1 minute	
Dimensions		See outline drawing.	
Weight		Approx. 24 kg (52.91 lb)	
Accessories	Power cord	1 pc. (Cable length of 2.4 m)	
	Load input terminal cover	2 sets (cover and auxiliary band)	1 pc. (cover and two lock plates)
	Screw set for th load input	2 sets (bolts, nuts, and spring washers)	
	Heavy object warning label	1 pc.	
	Operation manual	1 pc.	
Electromagnetic compatibility (EMC)[3]		Conforms to the requirements of the following directive and standard. EMC Directive 2004/108/EC EN 61326-1 EN 61000-3-2 EN 61000-3-3	
Safety[4]		Conforms to the requirements of the following directive and standard. Low Voltage Directive 2006/95/EC[3] EN 61010-1 Class I Pollution degree 2	

1. Approximately 70 A when 100 Vac is applied
2. If the input voltage or input frequency is different, the following equation can be used to calculate the value.

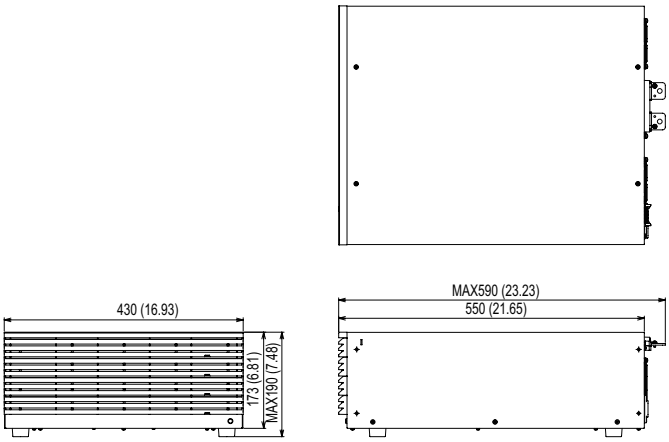
$$\text{Protective conductor current} = \frac{\text{Input voltage [V]}}{100\ [\text{V}]} \times \frac{\text{Input frequency [Hz]}}{50\ [\text{Hz}]} \times 500\ [\mu\text{A}]$$

3. Only on models that have CE marking on the panel. Not applicable to custom order models.
4. This instrument is a Class I equipment. Be sure to ground the protective conductor terminal of the instrument. The safety of the instrument is not guaranteed unless the instrument is grounded properly

Dimensions



PLZ2004WB Unit: mm (inch)



PLZ2004WHB Unit: mm (inch)

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Inquiry about Product

When making an inquiry about the product, please provide us with the following information.

Model (indicated at the top section on the front panel)

Serial number (indicated at the bottom section on the rear panel)

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